

Notice of Allowability

Application No.

09/926,186

Examiner

Shouxiang Hu

Applicant(s)

KAWASAKI ET AL.

Art Unit

2811

aw

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the 01-30-04 Interview.
2. ☒ The allowed claim(s) is/are 11-15, 17-23 and 31.
3. ☒ The drawings filed on 20 September 2001 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 - (a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No. _____.
 - (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the Examiner.
 - (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the margin according to 37 CFR 1.121(d).

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| 1 <input type="checkbox"/> Notice of References Cited (PTO-892) | 5 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6 <input checked="" type="checkbox"/> Interview Summary (PTO-413), Paper No. <u>20040130</u> . |
| 3 <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No. _____ | 7 <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8 <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9 <input type="checkbox"/> Other |

Shouxiang Hu

SHOUXIANG HU
PRIMARY EXAMINER

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Irina Zemel (RN: 43,402) on January 30, 2004.

The application has been amended as follows:

IN THE CLAIMS

1. Claims 1-10, 16, 24-30, 32 and 33 are canceled.
2. Claims 11, 21 and 31 are amended as and replaced by:

Claim 11. A semiconductor device as claimed in claim 31, wherein said substrate for
a basic structure contains

(1) a material of formula LnABO_4 or $\text{LnAO}_3(\text{BO})_n$,

wherein,

Ln is a rare earth element,

A is selected from the group consisting of Fe, Ga and Al,

B is selected from the group consisting of Mn, Co, Fe, Zn, Cu, Mg, and Cd

[, and ,

wherein said semiconductor layer is formed from a group II metal oxide].

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Claim 21 The semiconductor device according to claim 11,
further comprising a light emission layer formed on said semiconductor
layer by using a material having a composition or a structure identical to
that of said semiconductor layer as a base, and
a second semiconductor layer which is formed on said light emission layer
by using a material having a composition or a structure identical to that of
said semiconductor layer [as a base], and which has carriers that have a
different conductive sign from carriers of said semiconductor layer.

Claim 31. A semiconductor device comprising,
a substrate for a basic structure containing
(1) a material of formula LnABO_4 or $\text{LnAO}_3(\text{BO})_n$,
wherein,
Ln is a rare earth element,
A is selected from the group consisting of Fe, Ga and Al,
B is selected from the group consisting of Mn, Co, Fe, Zn, Cu, Mg, and
Cd, or
(2) a material of formula ScAlBeO_4 , ScBMgO_4 , ScBBeO_4 , or
 $\text{LnAO}_3(\text{MgO})_n$
wherein,
Ln is a rare earth element,
A is selected from the group consisting of Fe, Ga and Al
and

a semiconductor layer formed on said substrate,
wherein said semiconductor layer is formed from a material comprising [at
~~least one of] a group II metal oxide [or a group III nitride];~~
wherein said semiconductor layer is formed on said substrate by
depositing said semiconductor layer at temperatures from 350 °C to 600
°C, so as to achieve high nitrogen doping concentration therein.

Allowable Subject Matter

3. Claims 11-15, 17-23 and 31 are allowed.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance: Prior art does not teach or render obvious a basic structure in a semiconductor device as defined in the above allowed claims, comprising particularly: a substrate of LnABO₄, ScAlBeO₄, ScBMgO₄, ScBBeO₄, or LnAO₃(MgO)_n, and a group-II metal oxide semiconductor layer formed thereon, wherein the semiconductor layer is able to achieves high nitrogen doping concentration therein with the recited deposition temperature, as compared with the conventional one shown in Fig. 11 of the instant disclosure.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Conclusion

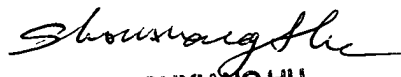
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shouxiang Hu whose telephone number is (571) 272-

1654. The examiner can normally be reached on Monday through Thursday, 7:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (703) 308-1690. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9318.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

SH
January 30, 2004


SHOUXIANG HU
PRIMARY EXAMINER